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ABSTRACT

Mindful of the potential hazards associated with products intended for young children, this article examines pediatric accidents involving strollers and walkers. According to the latest figures available from the National Electronic Injury Surveillance System of the United States (NEISS), more than 11,800 stroller injuries in 1987 were serious enough to require treatment in hospital emergency facilities. Approximately 10,300 of these injuries were suffered by children less than 4 years of age. Again, according to NEISS, more than 20,700 walker injuries in 1987 required emergency treatment. Almost all of the victims were children under 2 years of age. Results of research on walker-related injuries suggest that at least 36 percent of all children using walkers experience a fall while using them. While many of these mostly preventable accidents result in subclinical injuries that are not reported, when injuries do occur, head trauma is the most frequent. Discussion gives emphasis to prevention and recommendations are offered for the safe utilization of these devices. It is concluded that increased caregiver awareness of the need for safety precautions in the child-care environment could reduce the frequency of stroller- and walker-related accidents, and information on the safe use of these products should be incorporated into the standard information regarding accident prevention that might be made available to staff and parents. (RH)

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HAZARD PATTERNS AND INJURY PREVENTION WITH INFANT WALKERS AND STROLLERS

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A B S T R A C T

As child care providers continue to serve increasing numbers of infants and toddlers, we must remain mindful of the potential hazards associated with products intended for young children. This article examines pediatric accidents involving strollers and walkers, emphasizing prevention and offering recommendations for the safe utilization of these devices.

Each year, more children die from accidents than from all childhood diseases combined. Injury has become and remains the principal killer and a significant crippler of children beyond infancy in the western world (Berger, 1981). Although perinatal problems, prematurity, and congenital anomalies dominate the mortality statistics of the first year of life, the death rate from accidents is higher in the first year of life than at any time in the next fourteen years (Wegman, 1983).

The limitations of current medical care in the treatment of serious trauma and the considerable economic costs of treatment and rehabilitation, emphasize the importance of injury prevention. From the beginning of a child's life, products intended for a child must be selected and utilized with safety in mind-- crib, playpen, walker, high chair, etc. Parents and child care providers who serve babies and young children need to be aware of many potential hazards in the childcare environment-- hazards occurring through misuse of products, and with products that have not been well designed for their intended purposes (CPSC, 1985).

Accidents cause severe injuries in countless numbers of young children every day, and they represent a major pediatric problem in the United States. Widespread use of strollers and baby walkers in child care facilities as well as in the home, has produced a clearer understanding of the possible dangers associated with these particular products. This article examines pediatric accidents involving strollers and walkers, emphasizing prevention and offering recommendations for the safe utilization of these devices in our centers and to share with parents.

BABY STROLLERS

According to the U.S. Consumer Product Safety Commission (CPSC), baby strollers are a significant source of injury to infants. According to the latest figures available from the CPSC-- the National Electronic Injury Surveillance System of the United States (NEISS), 1987-- more than 11,800 stroller injuries in 1987 were serious enough to require treatment in hospital emergency facilities (see Table 1). Approximately 10,300 of these injuries were suffered by children less than four years old.

NEISS data also indicate that approximately 79 percent of all injuries related to strollers occur to the head and face area-- types of injuries that are the most potentially life-threatening. Head injury is the most common form of trauma for which children are admitted to hospitals. Head injury in childhood is not only the leading cause of death within the broad category of trauma, but it may also trigger many subtle changes in the child (Anderson and McLaurin, 1980). Finger injuries (approximately 765) were next most frequent type of stroller-related injury.

The most frequently reported diagnoses associated with strollers are contusions/abrasions (4,370 injuries), followed by internal injury (2,974) injuries and lacerations (2,944 injuries). According to the CPSC (1987), about 62 percent of stroller-related injuries involve the traditional types of strollers. Those types known as folding, or collapsible, and convertible stroller-carriage combinations are included in these categories. Umbrella strollers are involved in about 25 percent of the injuries. Review of the hazard patterns associated with different types of strollers reveal that the frequencies of the different accident patterns for emergency room-treated injuries do not differ greatly from one type of stroller to another, Approximately the same proportion of the injuries associated with each type

TABLE 1

Number of Injuries Treated
In Hospital Emergency Facilities
1987

Baby Strollers	Baby Walkers
11,818	20,791
13,498 (1988)	18,472 (1988)

SOURCE: National Electronic Injury Surveillance System of the United States, Washington, D.C., U.S. Consumer Product Safety Commission, 1987

result from falls, from tipovers, etc. Injuries and complaints have been reported about all of the major types of strollers and no one type accounts for the bulk of the injuries. Most of the hazards associated with strollers involve the entire class of products rather than one particular type of manufacturer.

Stroller Injury By Hazard Pattern

Falls from strollers (including cases in which the child falls out of the stroller without the stroller tipping over) is the most frequently reported hazard pattern of stroller-related injuries. The vast majority of injuries from falls are head injuries. Most of the injuries suffered in falls are contusions/abrasions or lacerations, although hematomas, concussions, and fractures also occur. In many reports of injury resulting from falls from strollers, child restraining straps are not present, or were present but not fastened.

Injuries involving either pinches or sharp edges on strollers are another fairly frequent hazard pattern. Almost all of these injuries are to either the victims' hands or fingers. Injuries usually occur when individuals catch their fingers or hands in frames, wheels, or tops of strollers. Amputations and crushings of fingers account for approximately one-fifth of pinches and sharp edge cases. Typically older children are injured while erecting or collapsing the stroller. Young children, occupying the stroller, are injured either when they are able to place a finger into an accessible pinch point while being pushed in the stroller, or when they place fingers into accessible scissor joints of the frame or ends of the tubing at the same time an adult is opening or closing that portion of the stroller.

Injuries sustained when strollers tip over are the third most frequent cited hazard pattern of stroller-related injury. The vast majority of injuries from strollers tipping over are head injuries resulting in contusions/abrasions, lacerations, and dental injuries. Approximately half of the cases of injuries resulting from stroller tipovers involve children who stand up in strollers (Rutherford and Miles, 1987).

Injuries resulting when a stroller is struck by a vehicle or knocked over occur fairly infrequently, representing less than 5 percent of the stroller injuries. Most of the injuries associated with the "knocked over" hazard occur as the victims are climbing into their strollers. While comparatively uncommon, cases in which strollers are struck by moving vehicles can result in serious injury or death.

Investigative findings by the CPSC from the data on fall and tipover injuries indicate that absence or ineffectiveness of restraint systems is a major factor. Almost all fall injuries involving rigid-framed strollers involved strollers which did not have restraint belts. In the cases involving umbrella strollers, the restraints were in use in most cases but were inadequate to prevent the child from falling out (Rutherford and Miles, 1987). Stability appears to be a problem most associated with strollers designed to accommodate two children, especially those on which the seats are mounted with one in front of the other.

Recommendation For Safe Stroller Use

Selection of nursery equipment appropriate for the size of the children one serves is very important in preventing accidents. A stroller purchased for children to "grow into" may increase their risk for injury. The following guidelines for purchasing a stroller are recommended by the CPSC:

* Choose a stroller which has a base wide enough to prevent tipping, even when the baby leans over the side. If the seat can be adjusted to a reclining position, make sure the stroller does not tip backward when the baby lies down.
* If a stroller has a basket for carrying supplies, it should be low on the back of the stroller and in front of (or directly over) the rear wheels. Hanging supply, storage or shopping bags over the handles may cause tipping.
* Check the seat belt to make sure it is strong and durable, fits snugly around your children, and can be easily fastened and unfastened. Use the seat belt each time you place the babies in the stroller.
* Make sure that the brake is convenient to operate and actually locks the wheels. Brakes on two wheels provide an extra measure of safety.

A few safety tips related to the proper use of strollers will set the pattern for accident prevention throughout its use by your children. Scanlon suggests that when folding or unfolding a stroller, keep your children away from it. Children's fingers have been amputated in parts of the folding mechanism. Also, always secure the seat belt, and never leave a child unattended in a stroller. A stroller is not a toy-- never allow children to use one as a plaything (Scanlon, 1985). Finally, children should never be permitted to stand in the stroller, and the operator of the stroller should always be conscious of the possibility for accidents involving this conveyance. Wreckless operation of the stroller, or operation of the stroller without regard for particular terrain features (carpet, concrete, grass, etc.) simply increase the risk of accident and injury.

INFANT WALKERS

Infant walkers have been in use in the western world for several centuries, but only within the last couple of decades have they come to be a common item in our child care centers (Fazin and Felizberto, 1982). Infant walkers are also popular household items in the United States, with an estimated one million walkers distributed in the United States in 1980 (Rieder, et al, 1986). Studies of walker use have reported that 55 to 86 percent of infants are placed in infant walkers prior to the onset of unassisted walking (Stoffman, et al, 1984; Kaufman and Ridenour, 1977).

Walker injuries represent a substantial fraction of all injuries sustained in the infant population. According to the most recent figures available from the CPSC-- the National Electronic Injury Surveillance System of the United State (NEISS), 1987-- more than 20,700 walker injuries in 1987 were serious enough to require emergency treatment in hospital facilities (see Table 1). Almost all of the victims are children under two years of age. Results of research on walker-related injuries suggest that at least 36 percent of all children using walkers experience a fall while using them (Stoffman, et al, 1984). Although most of the reported falls in the study did not necessitate medical care, the high prevalence of walker use (82 percent of those surveyed) suggests that a sizeable number of preventable injuries are occurring. Inasmuch as most of the walker accidents are not reported to the family physician, it has been observed that baby walker accidents may represent a new unrecognized cause of pediatric morbidity (Fazin and Felizberto, 1982).

It is estimated that nearly half of the users of baby walkers will be involved in an accident resulting from a tip over, a fall down stairs, or a finger entrapment (Fazin and Felizberto, 1982). The majority of these accidents result in subclinical injuries that are not reported. When injuries do occur, head trauma is the most likely problem noted. Data collected by the National Electronic Injury Surveillance System for 1987 indicate that approximately 86 percent of all injuries related to baby walkers occur to the head and face area. The next most common area of injury is the hand and fingers. The most frequently reported diagnosis associated with baby walkers are contusions/abrasions (9,780 injuries), followed by internal injury (5,151 injuries) and lacerations (3,425 injuries). In 1971, a mandatory requirement from the CPSC banned any walker that contained exposed parts capable of causing amputations, lacerations, crush injuries, fractures, hematomas, bruises, or, other injuries to fingers, toes, or other parts of the anatomy of young children. These types of injuries are now on the decline (Wellman and Paulson, 1984).

Baby Walker Injury by Hazard Pattern

With the exception of burn injuries related to walker use, almost all serious injuries sustained by babies in walkers originate from falls down stairs. Falls down stairs in baby walkers represent over half of baby walker related injuries treated in U.S. hospital emergency rooms. In addition, they constitute the most severe baby walker-associated injuries. Almost all of the victims who are hospitalized as a result of baby walker accidents will have fallen down stairs (Rutherford and Stouffer, 1981). A typical scenario of a stair accident is "a child scooting over to an unguarded doorway and falling down the stairs." This type of accident

occurs when doors to stairs are left open or unlatched or when a stair gate is not present or is unlatched.

The vast majority of all falls down stairs associated with baby walkers involve children from 6 to 12 months of age. At this age, the child is curious about his or her environment and explores it actively without a knowledge of hazards. The young child's motor skills are developing at a rapid rate, and he or she is aware of the increased mobility the baby walker allows. At this period in their development, they are almost completely dependent upon their caregivers for protection. While the plastic and metal frame of the baby walker supports the infant, the wheels give mobility well beyond that expected for the infant's age. In fact, it has been estimated that a baby in a walker can cover 1 meter in 1 second (Lang-Runtz, 1983). This outpaces the reaction time of the occupied caregiver.

The second most common hazard pattern involving baby walkers are tipover accidents. Several commonly found scenarios are "the child maneuvering onto a carpet from a hardwood floor and tipping the walker," and "the child reaching over to pick up an object on the floor and tipping." Frequently the child does not firmly hold onto the walker and if the walker tips, the child does not simultaneously fall with the walker. Often, the infant continues to push when his or her walker encounters an obstacle. At some point, the infant is thrown off balance which, most likely, places his or her center of gravity beyond the wheelbase, and the system tips over.

Another fairly frequent hazard pattern involving baby walkers is finger entrapment. Children's fingers have been amputated in the older baby walkers with x-frames which act like scissors when being closed. A Federal Hazardous Substances Act regulation for walkers bans any baby walker which

has exposed parts that can amputate, crush, cut, break, or bruise a child's fingers or toes. This covers x-frame walkers, coil-spring baby bouncers, and walkers with holes or tubes that can injure a finger or toe.

Recommendations For Safe Use of Baby Walkers

When considering the purchase of a baby walker, select one that is stable. The walker is less likely to tip over if the wheel base is wide. In addition, look for plastic sleeves over coil springs. Metal parts should have no sharp edges or points. Inspect the seat and the straps to make sure they are strong and secure. Make sure that the "x-joint" of an x-frame walker is covered by a protective sleeve and that it is equipped with locking devices to prevent the x-frame from collapsing.

Lack of supervision and environmental factors contribute to a striking number of infant walker accidents. Walkers are not intended to be baby sitters, and should never be substituted for constant supervision.

The following safety tips are recommended as ways to prevent accidents involving baby walkers:

* Place securely latched guards at the top of all stairways, or keep stairway doors closed to prevent falls.
* Use baby walkers only in areas where there are smooth surfaces. Edges of carpets, throw rugs, or raised thresholds can cause walkers to tip over.
* Use caution when moving the walker from one surface to another.
* Monitor the amount of time your children spend in a walker.The more time spent in the walker per day, the more likely the children are to have an accident.
* Maintain constant vigilance of infants in walkers. A walker

affords an infant surprising mobility and speed necessitating especially quick reactions on the part of the caregiver.

* Look for and abide by manufacturers' recommendations regarding maximum weight of a child who may use the walker. Maximum weights of walkers vary from product to product from as low as 19 pounds to as high as 40 pounds.

Following an injury, even as serious as a fracture, walker and stroller use are more likely than not to continue, on occasion with the result of another injury (Rieder, et al, 1986). Increased caregiver awareness of the need for safety precautions in the child care environment could reduce the frequency of stroller and walker-related accidents, and information on the safe use of these products should be incorporated into the standard information that might be made available to staff and parents regarding accident prevention. At the very least, a statement concerning the risks of stroller and walker-related injuries should be enclosed with every stroller and walker sold.

It should be noted that many walkers and strollers involved in accidents had been kept in child care centers and households after their acquisition some years earlier-- or purchased secondhand. In routine use, they are unlikely to be worn out or damaged by the young children placed in them. This highlights the importance of including discussions of child safety as part of any comprehensive well-child care shared with parents.

Notably, the number of injuries reported by the National Electronic Injury Surveillance System underestimates the total number of stroller and walker injuries as the NEISS report does not include those accidents that

result in subclinical injury or significant injuries treated outside of the emergency room. Child care providers should include information about strollers and walkers in their safety-related anticipatory guidance to staff and parents; and, as mentioned before, manufacturers should include similar warnings in the product information packed with the merchandise. When parents and other child caregivers learn these precautions early on, it decreases the chances of serious injury-producing accidents, and it contributes to a healthier environment in which to serve the young children in our care.

References

D.W. Anderson and R.L. McLaurin (Ed.S.), (1980) "The national head and spinal cord injury survey," Journal of Neurosurgery, 53 (Supplement).

L. Berger, (1981) "Childhood injuries, recognition and prevention," Current Problems in Pediatrics, 12, 1.

L.E. Fazen III and P.I. Felizberto, (1982) "Baby walker injuries," Pediatrics, 70, 1.

I. Kauffman and M. Ridenour,(1977) "Influences of an infant walker on onset and quality of walking pattern of locomotion," Perceptual Motor Skills, 45,.

H. Lang-Runtz, (1983) "Preventing accidents in the home," Canadian Medical Association Journal, 129.

M.J. Rieder, C. Schwartz and J. Newman, (1986) "Patterns of walker use and walker injury," Pediatrics, 78, 3.

G.W. Rutherford and D. Stouffer, (July,1981) Injuries associated with baby walkers, Washington, D.C.: Consumer Product Safety Commission, Division of Hazard Analysis and Division of Human Factors.

G.W. Rutherford Jr. and R. Miles, (1987) Hazard analysis: Injuries associated with strollers and carriages, Washington, D.C.: U.S. CPSC, Division for Hazard Identification and Analysis - Epidemiology.

T.M. Scanlon, (1985) "Safe nursery equipment," Consumers' Research Magazine, 68, 11.

J. Stoffman, M.J. Bass and A.M. Fox, (1984) "Head injuries related to the use of baby walkers," Canadian Medical Association Journal, 131, 6.

U.S. Consumer Product Safety Commission, (1985) The safe nursery buyer's guide, Washington, D.C., CPSC.

M.E. Wegman, (1983) "Annual survey of vital statistics," Pediatrics, 72.

S. Wellman and J.A. Paulson, (1984) "Baby walker-related injuries," Clinical Pediatrics, 23, 2.